To: Williams, Laura[williams.laura@epa.gov]
Cc: McKean, Deborah[mckean.deborah@epa.gov]; Wall, Dan[wall.dan@epa.gov]
From: Wharton, Steve
Sent: Tue 9/8/2015 3:38:28 PM
Subject: FW: Links to USGS sediment core studies on mine tailings in the Animas River in Silverton, CO
Copy of Secondary Data Sources - Animas 08272015.xlsx

Laura – Here is the table of secondary (i.e., non-EPA) data sources and an additional link for historical sediment data.

Steve

From: Wharton, Steve
Sent: Thursday, September 03, 2015 5:54 PM
To: McKean, Deborah
Subject: FW: Links to USGS sediment core studies on mine tailings in the Animas River in Silverton, CO

Deb – These are the USGS sediment core studies we discussed earlier today.

I'll also send some other sediment related data sources tomorrow.

Thanks,

Steve

From: Kappelman, David
Sent: Sunday, August 30, 2015 10:49 AM
To: Wharton, Steve
Subject: FW: Links to USGS sediment core studies on mine tailings in the Animas River in Silverton, CO

FYI

David Kappelman

USEPA Environmental Response Team

cell 513-240-6840

From: Turner, Philip
Sent: Sunday, August 30, 2015 12:38 PM
To: Bhattacharya, Dipanjana; Milburn, Anna; Fagen, Elizabeth
Cc: Kappelman, David; Smith, Monica; Crossland, Ronnie
Subject: FW: Links to USGS sediment core studies on mine tailings in the Animas River in Silverton, CO

May be of use when thinking about historic data

From: Hunt, Laura
Sent: Sunday, August 30, 2015 9:51 AM
To: Turner, Philip; Rauscher, Jon
Subject: Links to USGS sediment core studies on mine tailings in the Animas River in Silverton, CO

http://toxics.usgs.gov/pubs/wri99-4018/Volume1/sectionA/1202_Church/pdf/1202_church.pdf

http://toxics.usgs.gov/pubs/wri99-4018/Volume1/sectionA/1213_Vincent/pdf/1213_Vincent.pdf

Not sure if you have seen these studies conducted by USGS in Silverton, Co. They analyzed core samples and used geomorphologic mapping methods to identify old pre-mining sediments from the Animas River. Some findings:

•□□□□□□□ Using vanadium as a lithologic tracer for sediment derived from natural erosion of the watershed, we estimate that the fine fraction of streambed and floodplain sediments deposited after 1900 A.D. contain, in general, two-thirds tailings and one-third natural sediments

•□□□□□□□ Preliminary analysis of the geochemical data, when coupled with both the historical and geochronological record, clearly show that there has been a major impact by historical mining activities on the geochemistry of the fluvial bed sediments.

•□□□□□□□ The impact of historical mining activity is clearly recorded in the sedimentological record as shown in the study of sediments from the trench section (Vincent and others, 1999).

•□□□□□□□ Historical mining activity has resulted in a substantial increase in metals in the very fine sand to clay sized component of the bed sediments of the upper Animas River, and Cement and Mineral Creeks.

•□□□□□□□ Enrichment factors for metals in modern bed sediments, relative to those sediments that are clearly pre-mining in age, range from a factor of 2 to 6 for arsenic, 4 to more than 10 for cadmium, 2 to more than 10 for lead, 2 to 5 for silver, and 2 to more than 15 for zinc.

Might be helpful for the proposed core sampling.

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Laura Hunt, PhD

U.S. EPA Region 6

Water monitoring and assessment section (6WQ-EA)

1445 Ross Avenue

Dallas, Tx 75202

214-665-9729

hunt.laura@epa.gov

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